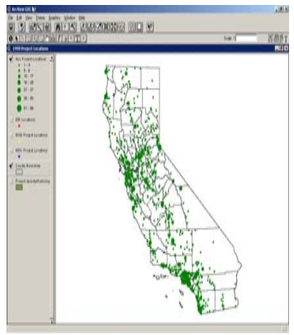
Recommendation 3 (cont.)

Data sharing should be instituted among MPOs, RTPAs, and Caltrans, . Data types necessary for all urban modeling include: census data on households, county boundaries, roads, railroad lines, major rivers, all streams, digital elevation maps, slopes, general soil types, agricultural lands, vegetation types (plant communities), important habitats, public lands, parcels, and land use plans. Many counties have most, or all, of these data layers. The Information Center for the Environment at UC Davis has prepared a statewide general plan layer and generalized it to 15 land use classes. Counties, RTPAs, and MPOs can use this layer or they can use the data in its native format (with all local plan categories), if they do not have their own data. Data necessary for the advanced integrated urban models include, in addition to the above data: employment by location and type, floorspace by location and type of economic activity and type of land use and type of building, floorspace lease values, floorspace consumption by households and firms by type and location, and origins/destinations for worktrips by type of employment and household type. It would be useful to have coordination between the State and regional agencies for data collection, classification, and publication, so that various organizations could use the same data types and, wherever possible, the same data categories. This standardization would facilitate data sharing, make it easier to understand other agencies' models and reports, and make many modeling exercises comparable across jurisdictions. Perhaps the university or some other entity could provide a web site listing funding sources used by MPOs and RTPAs



Recommendation 4

Caltrans should consider implementing a statewide integrated interregional urban model. Such a model should be implemented in phases, and should use the Statewide Travel Model that is currently being upgraded to more accurately represent the high speed rail, conventional passenger rail, and air travel modes. Goods movement could be represented well with these networks, but this is assuming that adequate activity data can be obtained. Such data is not currently available. A statewide integrated interregional model, if successfully implemented, would be able to provide consistent traffic flow data and goods movement data across the State, and so will permit the MPO and RTPA models to also incorporate consistent external trips data. This model would also allow Caltrans districts and Statewide staff to better evaluate interstate and interregional transportation improvements, such as new freeways, new high speed rail, conventional passenger rail upgrades, freeway widenings, and airport expansions. Both UrbanSim and PECAS would allow the evaluation of the effects of such interregional projects on housing prices across the State. PECAS would allow State officials, in addition, to evaluate the effects of transportation policies on the economy in various types of business in different areas of the state, and also to be able to assess a number of transportation and land use "scenarios" that cannot currently be evaluated using transportation models alone. These include (but are not limited to) jobs/housing proximity, economic fees and/or incentives programs, and the benefits and impacts of various proposed plans, programs, and projects on specific populations in different locations, especially those impacts effecting environmental justice considerations.

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Research and technology for decision support

FINAL REPORT TO CALTRANS :

ASSESSMENT OF REGIONAL INTEGRATED TRANSPORTATION/LAND USE MODELS

UC Davis
Information Center for the Environment

CONTENTS

Introduction to the Study

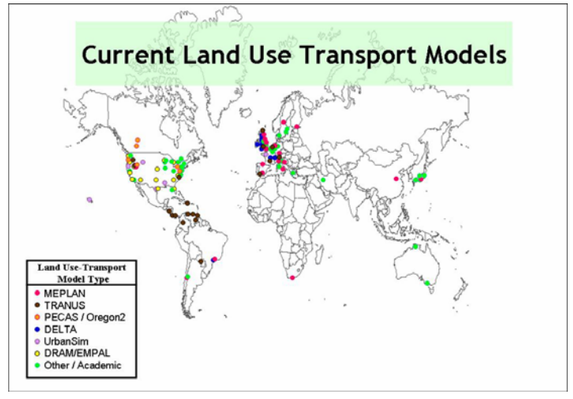
This study developed an overview and evaluation of integrated land use/economic/transportation models, including their unfolding benefits, potential applications, and implementation challenges. The project is timely because: (1) use of these types of models by metropolitan planning organizations (MPOs) and state Departments of Transportation is expanding, and (2) the major benefits of using these kinds of models are being revealed. Information contained in this study could improve planning and save valuable resources for jurisdictions considering adoption of integrated transportation/land use models. As an example, the state of Oregon alone redirected approximately $10 billion as a result of information gained using the intergrated modeling process.

In particular, this study examines two state-of-the-art microeconomics-based integrated land use and transportation models, UrbanSim and PECAS; the MEPLAN model, which might be considered as a partial evolutionary step toward PECAS; and one less-robust land use forecasting model, UPlan.

A key component of this research was assembling a technical advisory committee (TAC) comprised of modeling staff from Caltrans Headquarters, District Offices and selected California MPOs to give advice on a full range of issues being considered in the evaluation of these models

The main goal of this committee and this project was to facilitate a system of information exchange and evaluation. This began with the UC Davis research team presenting general information on integrated land use and transportation models to the TAC and the modeling community. In turn, the TAC and modeling community provided the research team with consistent feedback and criteria against which the models should be evaluated. The exchange loop between the TAC and the research team was maintained throughout this process.

Specific details on the models themselves were presented by the model developers—Doug Hunt (the developer of PECAS) from the University of Calgary, and Paul Waddell (the developer of UrbanSim) from the University of Washington—to the TAC, modeling community, and the research team during a series of workshops conducted in Northern Cali-

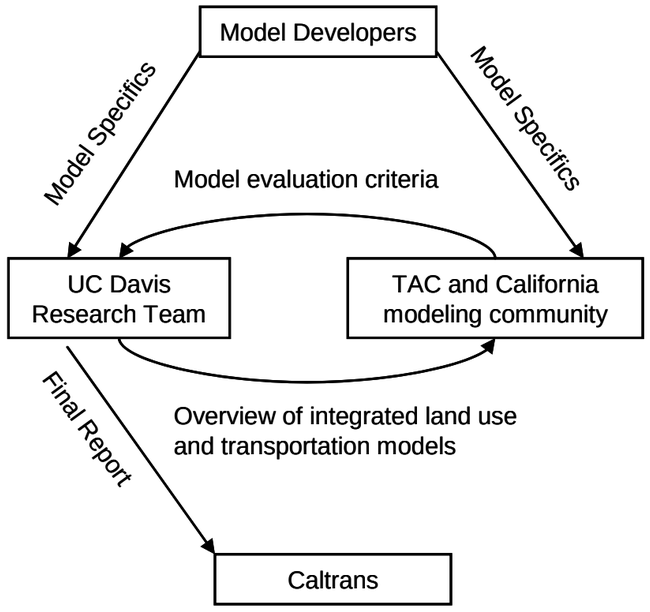


Introduction (cont.)

fornia, Southern California, and the Central Valley. The research team then applied the model evaluation criteria that was developed in coordination with the TAC and modeling community, and compiled this final report (This system of information exchange is presented in Figure 1 below).

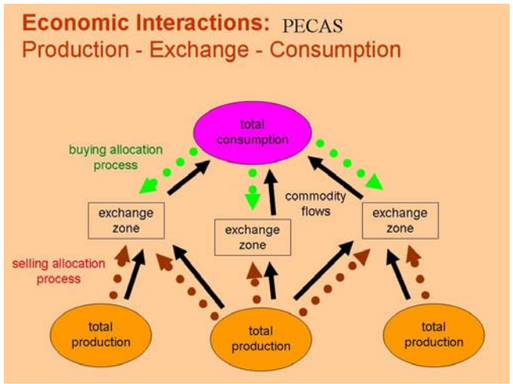
In California, the Sacramento Area Council of Governments (SACOG) has been a leader in integrated modeling and has implemented a variety of these models, including: DRAM/EMPAL, TRANUS, and MEPLAN. SACOG is currently calibrating a PECAS model. The SACOG experience is instructive for other MPOs seeking to develop similar models. Gordon Garry, Director of Research and Analysis at SACOG, gave one of the initial presentations to the TAC outlining how SACOG assessed user needs for the agency's integrated model. His experience, participation, and availability to the TAC and MPO staff were extremely valuable throughout this study.

The TAC was established at the onset of this project to help guide the process and help develop model evaluation criteria that would represent the various needs and expectations of California MPOs. The TAC was comprised of selected Caltrans staff and modeling staff from selected MPOs within California. It was anticipated that the criteria arrived at through meetings with the TAC and other California modelers would represent the issues and concerns that are specifically relevant to modeling practice in California. The authors of this report are indebted to the members of the TAC for their generous contributions to this study.



Recommendation 1

The TAC recommends that the four large MPOs (SCAG, MTC/ABAG, SANDAG, and SACOG) strongly consider implementing an integrated model in the near future. Our review showed that UrbanSim and PECAS are the two most advanced models and that several MPOs across the U.S. are applying them. Indeed, SACOG has already started implementing the PECAS model. SCAG has commissioned a report comparing advanced models, including these two. Our research demonstrated that these two models are behaviorally based in microeconomics and produce useful outputs regarding land use changes over time. For those MPOs also interested in projecting the effects of transportation or land use policies on housing prices and/or commercial development or redevelopment, both models are useful. For those MPOs additionally interested in goods movements, the PECAS model seems to better represent these flows, as it uses an input-output table as an overall structure for the other model interactions.



Recommendation 2

The TAC also recommends that medium-sized MPOs and RTPAs in California consider implementing simpler urban models, such as PLACES, What If?, UPlan, and others. Most of these models are based in GIS and so readily produce useful maps. SACOG and SLO-COG have already successfully used PLACES, for example, for rapid scenario testing. The UPlan model was used successfully by the Merced County Association of Governments two years ago for joint land use/habitat/transportation planning, and UPlan currently is being applied by Calaveras, Alpine, and Tuolumne counties for land use planning and for transportation planning. Recently, the San Joaquin Valley consortium of eight counties was awarded a Caltrans "Blueprint" planning grant and they have selected the UPlan model for use in scenario testing over the next two years.